

CLAIMS

What is claimed is:

- 5 1. A method of comminuting/pulverizing polyurethane-containing materials
to produce fine particles comprising:
 chopping the polyurethane-containing materials, thereby producing a
polyurethane-containing flock;
 processing further said polyurethane-containing flock through at least one
10 input of a comminuting/pulverizing process having an output, wherein said
comminuting/pulverizing process has at least two steps; and
 adding a solid additive at any time during the comminuting/pulverizing
process.
- 15 2. The method according to claim 1 wherein said polyurethane-containing
materials are polyurethane foam.
3. The method according to claim 1 wherein said solid additive is added at
said at least one input of said comminuting/pulverizing process with said polyurethane-
containing materials.
- 20 4. The method according to claim 1 wherein said solid additive is added at
said output of said comminuting/pulverizing process with said polyurethane-containing particles.

5. The method according to claim 1 wherein said solid additive is added during a recirculation loop that returns oversized polyurethane-containing materials to a mill for continued comminution.

5 6. The method according to claim 1 wherein said solid additive is approximately 0.5 microns to 200 microns in size.

7. The method according to claim 1 wherein said solid additive is approximately 0.2 mm to 5 mm in size.

10 8. The method according to claim 1 wherein said solid additive is electrically conductive.

9. The method according to claim 10 wherein said electrically conductive
15 solid additive is chosen from the group consisting of carbon black, graphite, flaked metals, powdered metals, conductive metal oxides and electrically insulating materials coated with tin oxide.

10 10. The method according to claim 1 wherein said solid additive is electrically insulating.

11. The method according to claim 10 wherein said electrically insulating solid additive is chosen from the group consisting of hydrous silicate, silica and fumed silica, fly

ash, metal-stearate salt, metal-carbonate salt, metal-sulfate salt, zeolite, melamine, molecular sieve, clay, fluoropolymer, zinc oxide, and titanium diboride.

12. The method according to claim 1 wherein said solid additive is added in
5 an amount of approximately between 500 ppm and 40 % by weight.

13. The method according to claim 1 wherein said solid additive is added in
an amount of approximately between 0.1 and 30 % by weight.

10 14. The method according to claim 1 wherein said solid additive is added in
an amount of approximately between 0.2 and 10 % by weight.

15. The method according to claim 1 wherein said comminuting/pulverizing
process has at least two steps further comprising:

15 a grinding step having two inputs and an output, wherein a first input is an
feed input and a second input is a feedback input; and

a separation step having an input and two outputs, wherein an input is
coupled to an output of said grinding step, and a first output is a product output, and a second
output is a feedback output coupled to said feedback input of said grinding step.

20 16. The method according to claim 15 wherein said comminuting/pulverizing
process further comprises a conveying system step between said grinding step and said
separating step.

17. The method according to claim 15 wherein said separating step further comprises a sifter having at least one screen.

18. The method according to claim 17 wherein adding said solid additive prevents blinding of said at least one screen in said sifter.

19. The method according to claim 15 wherein adding said solid additive improves grinding in said grinding step.

20. The method according to claim 15 wherein adding said solid additive prevents plating in said separation step.

21. The method according to claim 16 wherein adding said solid additive prevents plating in said conveying system step between said grinding step and said separating step.

22. The method according to claim 4 wherein adding said solid additive at said output of said comminuting/pulverizing process with said polyurethane-containing particles improves the flowability of said polyurethane-containing particles.

23. The method of comminuting/pulverizing polyurethane-containing materials to produce fine particles according to claim 13 wherein said fine particles are used to

produce polyurethane-containing foam having approximately 0.01 to 10 % by weight of said electrically insulating solid additive.

24. A method of comminuting/pulverizing polyurethane-containing materials
5 to produce fine particles comprising:

chopping the polyurethane-containing materials, thereby producing a
polyurethane-containing flock;

processing further said polyurethane-containing flock through at least one
input of a comminuting/pulverizing process having an output, wherein said

10 comminuting/pulverizing process has at least two steps; and

adding hydrous silicate at any time during the comminuting/pulverizing
process.

25. The method according to claim 24 wherein said polyurethane-containing
15 materials are polyurethane foam.

26. The method according to claim 24 wherein said hydrous silicate is added
at said at least one input of said comminuting/pulverizing process with said polyurethane-
containing materials.

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27. The method according to claim 24 wherein said hydrous silicate is added
at said output of said comminuting/pulverizing process with said polyurethane-containing
particles.

28. The method according to claim 24 wherein said hydrous silicate is added during a recirculation loop that returns oversized polyurethane-containing materials to a mill for continued comminution.

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29. The method according to claim 24 wherein said hydrous silicate is approximately 0.5 microns to 200 microns in size.

30. The method according to claim 24 wherein said hydrous silicate is
10 approximately 0.2 mm to 5 mm in size.

31. The method according to claim 24 wherein said hydrous silicate is added in an amount of approximately between 500 ppm and 40 % by weight.

15 32. The method according to claim 24 wherein said hydrous silicate is added in an amount of approximately between 0.1 and 30 % by weight.

33. The method according to claim 24 wherein said hydrous silicate is added in an amount of approximately between 0.2 and 10 % by weight.

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34. The method according to claim 24 wherein said comminuting/pulverizing process has at least two steps further comprising:

a grinding step having two inputs and an output, wherein a first input is an feed input and a second input is a feedback input; and

a separation step having an input and two outputs, wherein an input is coupled to an output of said grinding step, and a first output is a product output, and a second
5 output is a feedback output coupled to said feedback input of said grinding step.

35. The method according to claim 34 herein said comminuting/pulverizing process further comprises a conveying system step between said grinding step and said separating step.

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36 The method according to claim 34 herein said separating step further comprises a sifter having at least one screen.

37 The method according to claim 36 wherein adding said solid additive
15 prevents blinding of said at least one screen in said sifter.

38. The method according to claim 37 herein adding said hydrous silicate prevents plating in said grinding step.

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39. The method according to claim 34 wherein adding said hydrous silicate prevents plating in said separation step.

40. The method according to claim 35 wherein adding said hydrous silicate prevents plating in said conveying system step between said grinding step and said separating step.

5 41. The method according to claim 27 wherein adding said solid additive at said output of said comminuting/pulverizing process with said polyurethane-containing particles improves the flowability of said polyurethane-containing particles.

10 42. The method of comminuting/pulverizing polyurethane-containing materials to produce fine particles according to claim 24 wherein said fine particles are used to produce polyurethane-containing foam having approximately 0.01 to 10 % by weight of said hydrous silicate.

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